DIGITAL-LOGIC

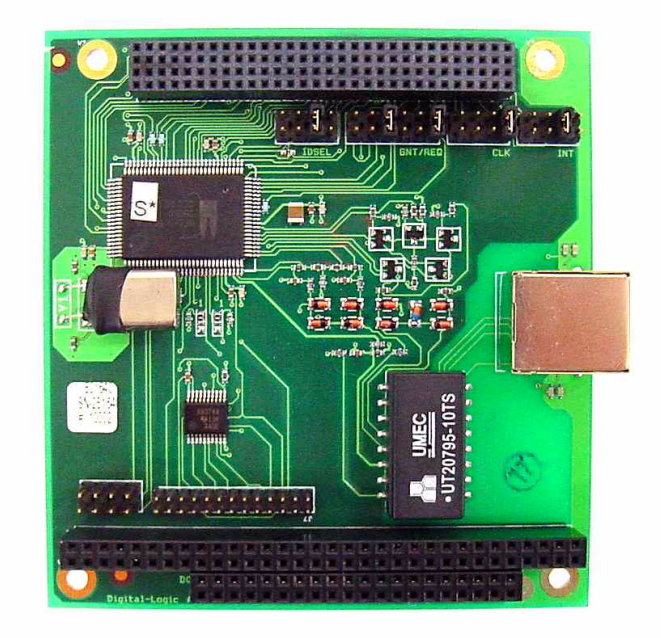
smart embedded computers

TECHNICAL USER'S MANUAL FOR:

MICROSPACE®

PC/104 and peripheral board

MSMI104+



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1 PREFACE

This manual is for integrators and programmers of systems based on the MICROSPACE card family. It contains information on hardware requirements, interconnections, and details of how to program the system. The specifications given in this manual were correct at the time of printing; advances mean that some may have changed in the meantime. If errors are found, please notify DIGITAL-LOGIC AG at the address shown on the title page of this document, and we will correct them as soon as possible.

1.1 How to use this Manual

This manual is written for the original equipment manufacturer (OEM) who plans to build computer systems based on the single board MICROSPACE-PC. It provides instructions for installing and configuring the MSM486SL or MSM386SN board, and describes the system and setup requirements.

1.2 Trademarks

Chips & Technologies	SuperState R
MICROSPACE, MicroModule	DIGITAL-LOGIC AG
DOS Vx.y, Windows	Microsoft Inc.
PC-AT, PC-XT	IBM
NetWare	Novell Corporation
Ethernet	Xerox Corporation
DR-DOS, PALMDOS	Digital Research Inc. / Novell Inc.
ROM-DOS	Datalight Inc.

1.3 Disclaimer

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1.4 Who should use this Product

- Electronic engineers with know-how in PC-technology.
- Without electronic know-how we expect you to have questions. This manual assumes, that you have a general knowledge of PC-electronics.
- Because of the complexity and the variability of PC-technology, we can't give any warranty that the product will work in any particular situation or combination. Our technical support will help you to may find a solution.
- Pay attention to the electrostatic discharges. Use a CMOS protected workplace.
- Power supply OFF when you are working on the board or connecting any cables or devices.

This is a high technology product.
You need know-how in electronics and PC-technology to install the system !

1.5 Recycling Information

Hardware:

- Print: epoxy with glass fiber
wires are of tin-plated copper

- Components: ceramics and alloys of gold, silver
check your local electronic recycling

Software:

- no problems: re-use the diskette after formatting

1.6 Technical Support

1. Contact your local Digital-Logic Technical Support in your country.
2. Use Internet Support Request form on http://www.digitallogic.com -> support -> support request form
3. Send a FAX or an E-mail to DIGITAL-LOGIC AG with a description of your problem.

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Internet www.digitallogic.com

➔ Support requests will only be accepted with detailed informations about the product (BIOS-, Board-version) !

1.7 Limited Warranty

DIGITAL-LOGIC AG warrants the hardware and software products it manufactures and produces to be free from defects in materials and workmanship for one year following the date of shipment from DIGITAL-LOGIC AG, Switzerland. This warranty is limited to the original purchaser of product and is not transferable.

During the one year warranty period, DIGITAL-LOGIC AG will repair or replace, at its discretion, any defective product or part at no additional charge, provided that the product is returned, shipping prepaid, to DIGITAL-LOGIC AG. All replaced parts and products become property of DIGITAL-LOGIC AG.

Before returning any product for repair, customers are required to contact the company.

This limited warranty does not extend to any product which has been damaged as a result of accident, misuse, abuse (such as use of incorrect input voltages, wrong cabling, wrong polarity, improper or insufficient ventilation, failure to follow the operating instructions that are provided by DIGITAL-LOGIC AG or other contingencies beyond the control of DIGITAL-LOGIC AG), wrong connection, wrong information or as a result of service or modification by anyone other than DIGITAL-LOGIC AG. Neither, if the user has not enough knowledge of these technologies or has not consulted the product manual or the technical support of DIGITAL-LOGIC AG and therefore the product has been damaged.

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2 OVERVIEW

2.1 Ordering Information

Ordering Information: (To be determined)	
MSMI104+	PC/104+ ISDN peripheral controller

2.2 General Information

The product MSMI104+ can be described as following:

- PC/104+ PCI Bus 120 pin with selectable PCI slot
- Cologne HFC-S PCI A ISDN 2BDS0 Controller
- Dual ISDN B-channel for voice and data (Up to 128Kbit/s) and D-channel (16Kbit/s or 64Kbit/s depending on the service type)
- Integrated PCI spec. 2.2 for 3.3 and 5V bus signal

BUS:	
Standard:	PC/104+
Size and Type:	PCI multiplexed 32 Bit Address/Data Bus

Controller:	
Type:	HFC-S PCI A (Cologne)
Package:	QFP-100

Power Supply:	
Controller Power supply: V0.1	5V through PCI Bus 3V On board supply
Power consumption	150mW typical

Interfaces and connectors:	
RJ-45	8 Pin 90°

Physical Characteristics:	
Dimensions:	Length: 90mm
	Width: 96mm
	Height: 15mm

Operating Environment:			
Relative humidity:	5 - 90% non condensing		
Vibration:	5 to 2000 Hz		
Shock:	10g		
Temperature:	Operating:	Standard version: Recommended	-10°C to +85°C 0°C to +70°C
		Industry version:	(ask DIGITAL-LOGIC AG)
	Storage:	-55°C to +85°C	

Ordering Information:

MSMI104+	

2.3 ISDN technology overview

ISDN, which stands for Integrated Service Digital Network is a system of digital phone which has been available for over a decade. This system allows data to be transmitted simultaneously using high-to-end digital connectivity.

Using ISDN system, voice and data are carried by bearer channels (so-called B-channel) with a bandwidth of 64kbit/s (could also be limited to 56Kbit/s). A data channel (depending on the type of service) handles signalling at a rate of 16kb/s or 64kb/s.

There are two basics services for ISDN, that is to say BRI (Basic Rate Interface) and PRI (Primary Rate Interface). BRI (total transmission rate of 144kb/s) consists of two 64kb/s B channels and one D channel for 16kb/s

PRI can give greater capacity to the user, typically 23 B channels and one 64kb/s D channel (in Europe usually 30 D-channels and one D channel 64kb/s)

3 SOFTWARE

The drivers and utilities can be found on the MICROSPACE Application CD.

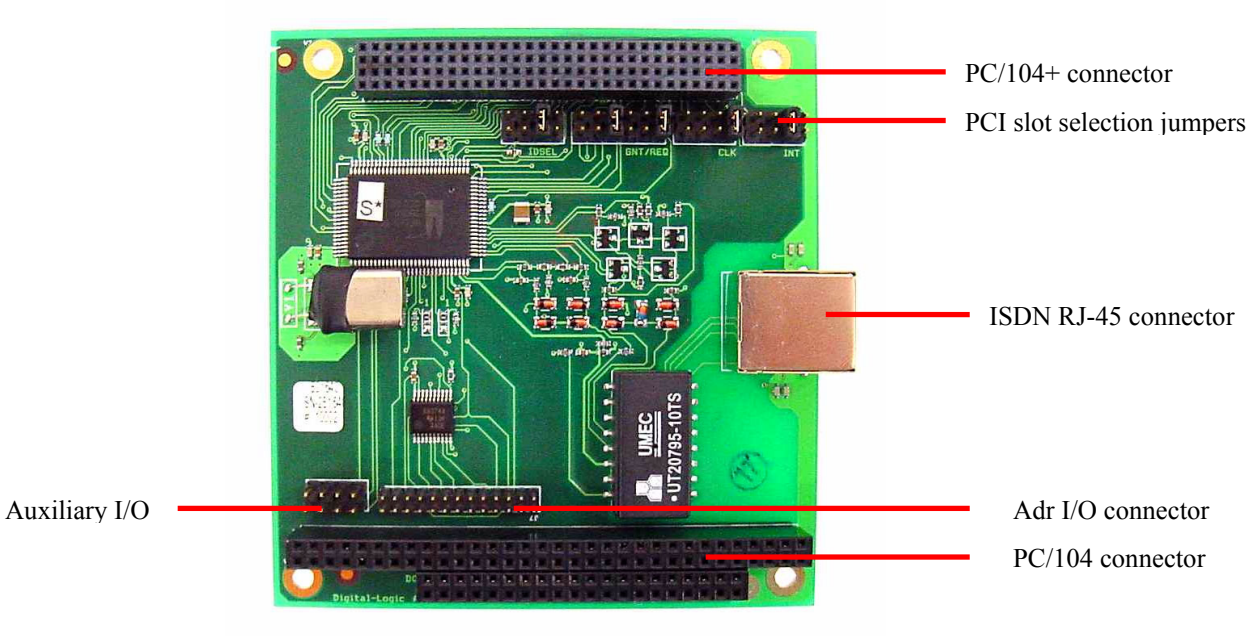
CD:\drivers\isdn\	File description
Utility\	Utility files (self diagnostic)
WIN95\	Driver files for Windows95
WIN98\	Driver files for Windows98
WIN2000\	Driver files for Windows2000
WINNT40\	Drive files for WindosNT4.0

4 CONNECTOR AND JUMPER DESCRIPTION

4.1 Product view

The following picture shows a front view from MSMI104+ Version 0.1. The connector references are further explained in section 4.2

Figure 4.1a: Interface connectors on MSMI104+



4.2 Connector references and types

Please refer to chapter 5 for detailed description of the pin position and connector outline (if not provided in this section) and position of the referenced connectors.

ISDN	
Type	RJ-45
Reference	**X1**

PC/104+	
Type	4x30pin PCI PC/104+
Reference	**J1**

PC/104	
Type	Standard PC/104 connector
Reference	**J6**

Auxiliary port data and address connector	
Type	13x2 Header (2mm)
Reference	**J7**

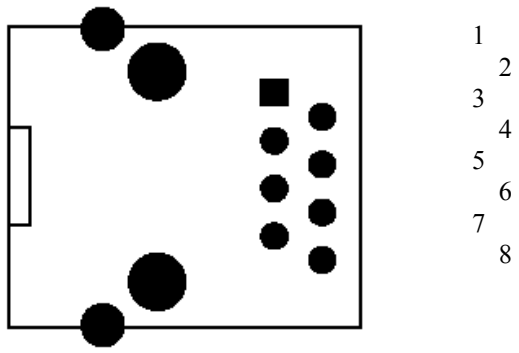
IOM2 connector	
Type	4x2 Header (2.54mm)
Reference	**J10**

4.2.1 X1: ISDN connector pin description

The following table provides the pin to pin connection to the ISDN RJ-45 connectors X1.

X1 Pin	Signal	X1 Pin	Signal
1		2	
3	ISDN_TRANSMIT+	4	ISDN_RECEIVE -
5	ISDN_RECEIVE +	6	ISDN_TRANSMIT-
7		8	

Figure 4.2.1: 2D Top view of ISDN connector with pin numbering

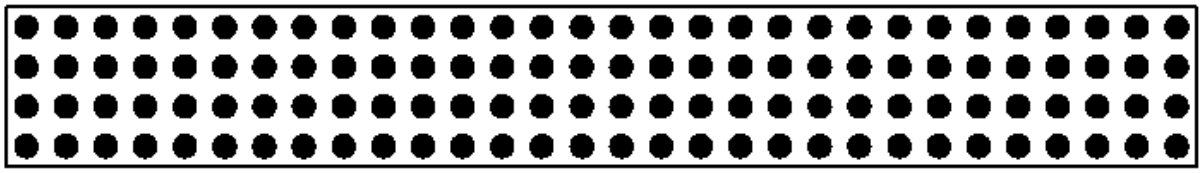


4.2.2 J1: PC/104+ connector description

J1 Pin	A	B	C	D
1	GND/5.0V KEY2	Reserved	+5	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0*	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1*	AD15	+3.3V
9	SERR*	GND	SB0*	PAR
10	GND	PERR*	+3.3V	SDONE
11	STOP*	+3.3V	LOCK*	GND
12	+3.3V	TRDY*	GND	DEVSEL*
13	FRAME*	GND	IRDY*	+3.3V
14	GND	AD16	+3.3V	C/BE2*
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3*	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0*	GND	REQ1*	VI/O
24	GND	REQ2*	+5V	GNT0*
25	GNT1*	VI/O	GNT2*	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD*	+5V	RST*
29	+12V	INTA*	INTB*	INTC*
30	-12V	Reserved	Reserved	GND/3.3V KEY2

Figure 4.2.2: 2D Top view of PC/104+connector with pin numbering

D1 D2 D3 … D30
C1 C2 C3 … C30
B1 B2 B3 … B30
A1 A2 A3 … A30



4.2.3 J6: PC/104 connector description

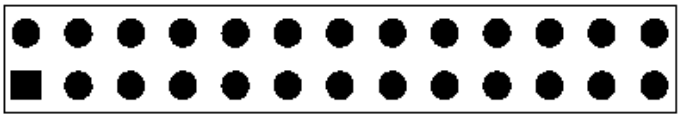
No special pin for PC/104 is required and used on MSMI104+ board. The only connected pins are these from the supply like 5V and GND. J6 is only present for customer who want to plug other board and make use of stack-through PC/104.

4.2.4 J7: Auxiliary port address and data connector

J7 Pin	Signal	J7 Pin	Signal
Pin 1	VCC3	Pin 2	GND
Pin 3	VCC	Pin 4	
Pin 5	AUX0	Pin 6	A0
Pin 7	AUX1	Pin 8	A1
Pin 9	AUX2	Pin 10	A2
Pin 11	AUX3	Pin 12	A3
Pin 13	AUX4	Pin 14	A4
Pin 15	AUX5	Pin 16	A5
Pin 17	AUX6	Pin 18	A6
Pin 19	AUX7	Pin 20	A7
Pin 21	GND	Pin 22	ADRWR #
Pin 23	AUXWR #	Pin 24	AUXRD #
Pin 25	GND	Pin 26	

Figure 4.2.4: 2D Top view of PC/104+connector with pin numbering

2 4 6 8 10 12 14 16 18 20 22 24 26
1 3 5 7 9 11 13 15 17 19 21 23 25



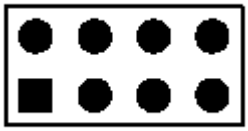
4.2.5 J10: IOM2 bus connector

J7 Pin	Signal	J7 Pin	Signal
Pin 1	C40IO	Pin 2	F1_A
Pin 3	F0IO	Pin 4	F1_B
Pin 5	STIO1	Pin 6	STIO2
Pin 7	GND	Pin 8	VCC3

The IOM Revision 2 standard defines an industry standard serial bus for interconnecting telecommunication ICs.
IOM2 bus is a synchronous full duplex communication link conatianing user data, control and programming, status channel.
A DSP (for example) and additional software can be used to interface to IOM2 bus.

Figure 4.2.5: 2D Top view of PC/104+connector with pin numbering

2 4 6 8
1 3 5 7



4.3 Jumper descriptions

This chapter provides description for all the jumper present on MSMW104+.

4.3.1 J2: PCI REQ, GNT select

J2 Pin	Open	J2 Pin	Closed
1-2	Not defined	1-2	REQ=REQ0
3-4	Not defined	3-4	REQ=REQ1
5-6	Not defined	5-6	REQ=REQ2
7-8	Not defined	7-8	GNT=GNT0
9-10	Not defined	9-10	GNT=GNT1
11-12	Not defined	11-12	REQ=GNT2

Note: Only one definition of REQ/GNT signal is possible at one time (for example, REQ0/GNT0 or REQ1/GNT1…)

4.3.2 J3: PCI PIRQ select

J3 Pin	Open	J3 Pin	Closed
1-2	Not defined	1-2	PIRQ=PIRQA
3-4	Not defined	3-4	PIRQ=PIRQB
5-6	Not defined	5-6	PIRQ=PIRQC
7-8	Not defined	7-8	PIRQ=PIRQD

Note: Only one definition of PIRQ signal is made possible by the device at one time (either A or B or C or D)

4.3.3 J4: PCI CLK select

According to PC/104+ specifications, the PCI clock present on the board must be choose according to its position relative to the main board (once above, second above…) CLK0, CLK1 and CLK2 index numbers are given relatively to the length of the clock path to the connector (CLK0 has the shortest track and CLK3 the longest)

J4 Pin	Open	J4 Pin	Closed
1-2	Not defined	1-2	PCICLK=CLK0
3-4	Not defined	3-4	PCICLK=CLK1
5-6	Not defined	5-6	PCICLK=CLK2
7-8	Not defined	7-8	PCICLK=CLK3

4.3.4 J5: PCI IDSEL select

J5 Pin	Open	J5 Pin	Closed
1-2	Not defined	1-2	IDSEL=IDSEL0
3-4	Not defined	3-4	IDSEL=IDSEL1
5-6	Not defined	5-6	IDSEL=IDSEL2
7-8	Not defined	7-8	IDSEL=IDSEL3

Note: Only one definition of IDSEL signal is allowed by the device at one time (either 0,1,2 or 3)

4.3.5 J8 and J9: AUX3 and AUX4 source

MSMI104+ can be configured for normal use like ISDN connection or provide access to auxiliary port bus. To change the settings, jumper J8 and J9 may be used.
Default position for both jumper is soldered on 1-2.

J8 Pin	1-2	J8 Pin	2-3
	Pull-up (ISDN config)		Buffer for AUX port

J18 Pin	1-2	J18 Pin	2-3
	Pull-up (ISDN config)		Buffer for AUX port

4.4 Default jumper configuration

In case something some jumpers was changed leading to a non-functioning or an unstable system, this is the default jumper configuration of the MSMI104+ V0.1

J2 closed on 1-2 and on 7-8
J3 closed on 1-2
J4 closed on 1-2
J5 closed on 1-2
J8 and J9 closed on 1-2

5 DIMENSIONS, CONNECTOR AND JUMPER LOCATIONS

The following two figures show the dimension of the MSMW104+ V0.9, standard PC/104+ product. For the connector references please consult the dedicated chapter 5.

5.1 Top view

Figure 5.1a: Top view with connector references and dimensions

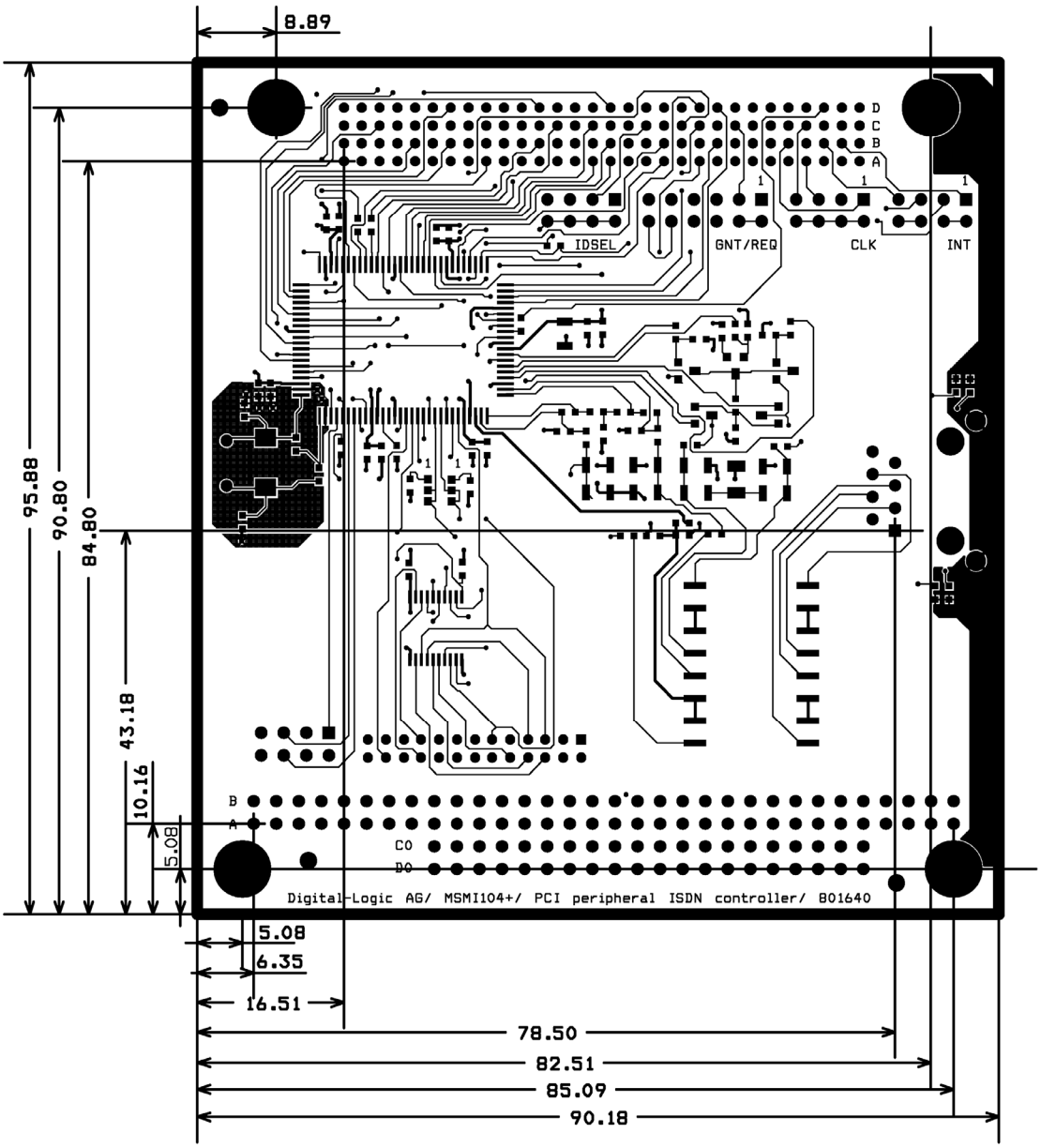
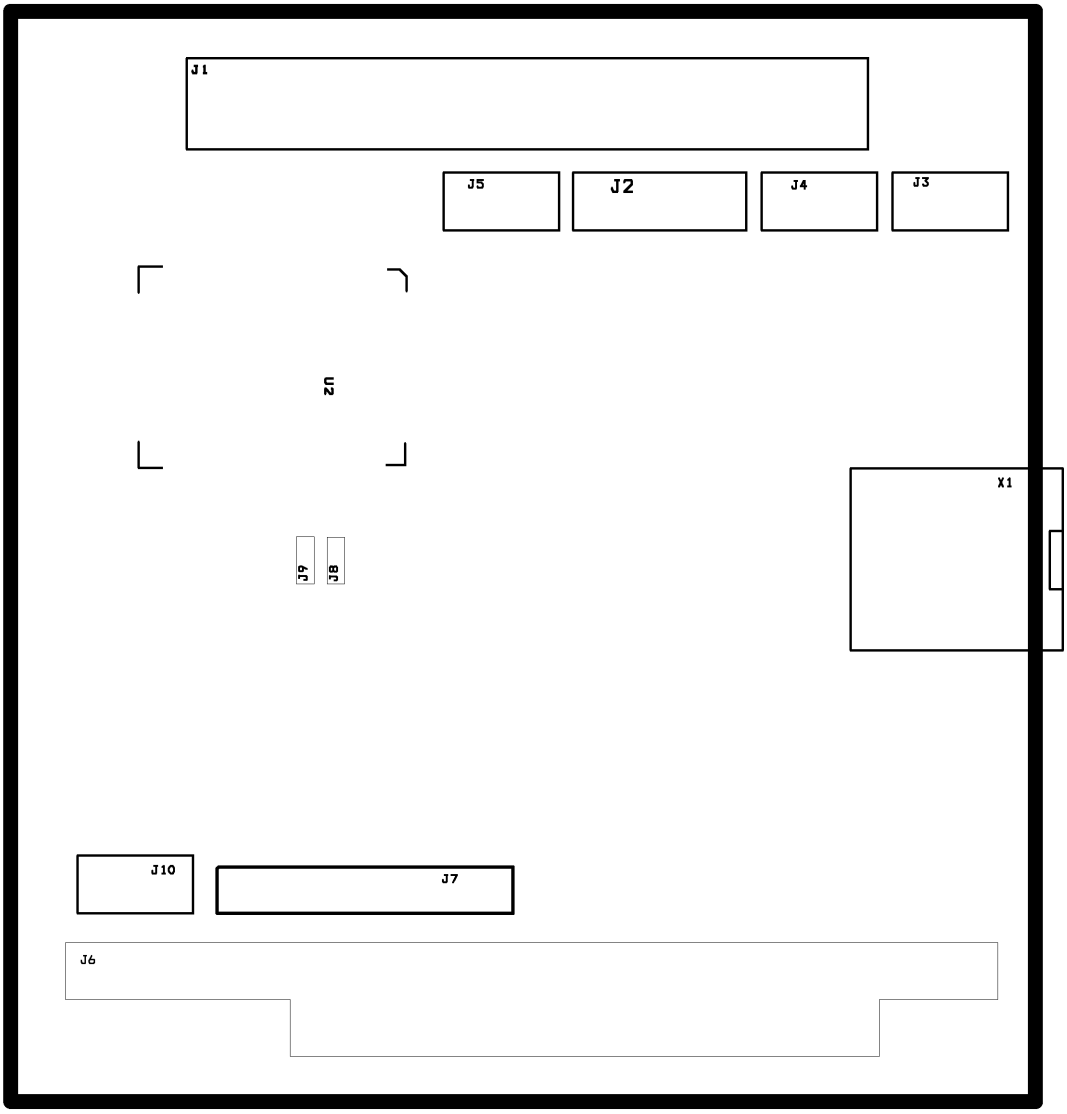


Figure 5.1b: Jumpers and connectors on the board



6 GETTING STARTED

This chapter is intended to show both the functionalities of the Cologne HFC-S PCI A ISDN 2BDS0 chip and the way to access them under a windows operating system.

6.1 Driver installation

Using Windows, the OS will detect a new device and ask for instaaling new drivers. Please select the right one from the product CD under the path which is shown in chapter 3.

The purpose of this manual is not to show how to install a new modem under Windows operating system. Please consult your OS manual instead.

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